Space Weather Forecast

Issued on Sunday, 27 August 2023 at 01:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares (R1-R2 Blackouts). Weak coronal mass ejection arrival possible day 4 (30 Aug) with slight chance of G1 Minor Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: One Moderate flare was observed peaking 26/2250 UTC from an uncertain source over the east limb. There are six sunspot regions on the disc. The largest region is currently in the north-centre disc, with ongoing development of small peripheral spots, but no overall growth observed. This was also the source of a common class flare that resulted in a subsequent weak coronal mass ejection (CME) being observed. The most complex looking region continues to be the smaller region in the southeast, with mixed polarity regions persisting in the same spot. The other regions are smaller unipolar spots.

The CME been analysed as likely Earth-directed, but was very faint and narrow. Subsequent arrival is currently modelled for day 4 (30 Aug), however confidence is low with any potential impacts.

Solar Wind / Geomagnetic Activity: Observed solar winds were at background, largely between 350-400 km/s. The interplanetary magnetic field (IMF) was predominately Weak but briefly peaked at Moderate between 26/2050-2130 UTC. The north-south component has been mainly Weak and negative (southward) with only brief periods of positive (northward) direction. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be generally Low, but with a chance of isolated Moderate class flares.

Solar Wind / Geomagnetic Activity: CME from a common class flare on 26 Aug is forecast to arrive on day 4 (30 Aug), however this was only faintly observed, and background wind speeds are expected. Consequently confidence is Low with any notable impact or increase to geomagnetic activity. The transition into a coronal hole fast wind is expected imminently on day 1 (27 Aug), with solar winds rising to 450-500 km/s. These winds then easing back toward background day 2 (28 Aug) onward. Geomagnetic activity is forecast to become Unsettled with Active intervals day 1 (27 Aug), before easing back to be mainly Quiet with isolated Unsettled intervals day 2 onward. CME arrival on day 4 (30 Aug) is likely to increase activity again to Unsettled to Active, with a slight chance of G1 Minor Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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